**Drone Testing notes for application to PEM mapping ground truthing**

**Introduction.**

We assessed the use of drones as tool in data collection and field validation for the Predictive Ecosystem Mapping (PEM) project. In August 10th and 11th 2020, we sampled 2 sites (4 transects) within Deception study area using a Phantom P4 pro DJI RPAS. Flights conducted by G.Perkins.

**Specifics tested:**

Drone: Phantom 4Pro – standard camera settings

App: Ground Station Pro – mapping and mission planning App

* Photomap type mission required.
* Photo
  + Tested Scan and Inside mode
  + Shooting angle (parallel to Main Path/Vertical to main path)
  + Capture mode

- Used 75% front back overlap – 70% side overlap by default (ideal between 65 – 80%)

-\*Note it is possible to import KML of area of interest (not tested)

Locations: Sites flow (partial flown)

* SBSmc2.2.5.10 (20200811 – 10 – 11am)
* SBSmc2.1.4.4.NE (August 11th 2020 , 11am-12 noon)
* SBSmc2.5.4.24\_cLHS (13:00 – 14:00) am
* SBSmc2.5.4.24\_SE (14:00)

**Flight testing options:**

Tested various data collection parameters within the photo collection and various heights, 25m, 60m, 80m, 100m, 120m. Tested hand flight vs preset control mission. Some basic testing with increasing heights 10m, 20m, etc – 80m (non-forested sited) and within forested sites (25, 35m, 45m, 55m to 85m).

**Post-processing:** Used drone2map to produce an ortho. Issues with the postprocessing as low flight level and lots of distortion with the trees. May not require an ortho and can just do a simple images. Another option is to take just images.

**General considerations:**

**Drone / Apps:**

In practice – hand flew drone to corner points to assess visibility and terrain of site, updated the mission plan accordingly, then captured images.

Unable to take additional photos when GSP app being used (need to switch apps).

**Optimum height**

Resolution using standard 60m is still a bit low for identification of ground. Able to ID tree sp at 60m

**Terrain:**

In mature forested sites (tree height 30m) there is some difficulty in completing entire transect while maintaining Visual Line of Site, depending on the terrain. Conducting flights at 115m height improved ability to complete flight, however reduced the resolution of images and was less useful for identifying ground vegetation.

Steep terrain was also challenging with current autoflight software as altitude is set from the take-off point and was not uniform across site. Tested hand flight option and also split transect into portions and flew at three height levels.

This may be improved using MapPilot /Drone Deploy software. Although the terrain resolution data for this is at a SRMT 60m resolution base maps. There is also an upper limit of 55N for mapping. A number of BCTS coastal folks are currently using this feature. Jennife Wade / Allana (BCTS) Adam stark / Caleb/ Vernon/grand forks.

**To investigate/Questions**

* mapPilot app for terrain adjusted auto missions
  + <http://support.dronesmadeeasy.com/hc/en-us/categories/200739936-Map-Pilot-for-iOS>
  + 70$ subscription
* Use individual images instead?
  + How to geo-rectify these.
* Use a higher quality camera?
  + Investigate camera settings / options for a higher resolution camera/drone? Larry ? Steve Rooke?